SOLUTION First find the value of the inside function, $g(30)$. As shown on the left in Figure 1-4e,

$$g(30) \approx 2.8$$

Use this output of function g as the input for function f, as shown on the right in Figure 1-4e. Note that the x in $f(x)$ is simply the input for function f and is not the same number as the x in $g(x)$.

$$f(2.8) \approx 180$$

$$\therefore f(g(30)) \approx 180$$

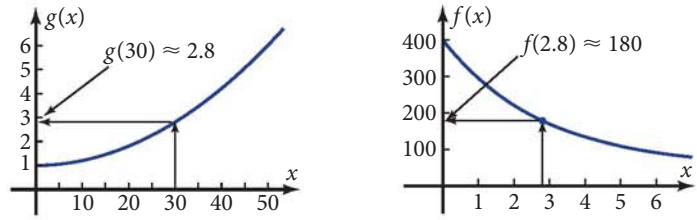

Figure 1-4e

Composite Functions from Tables

Example 2 shows you how to find values of a composite function when the two functions are defined numerically.

EXAMPLE 2 ➤ Functions f and g are defined only for the integer values of x in the table.

x	$f(x)$	$g(x)$
1	3	5
2	4	3
3	6	2
4	2	1
5	0	7
6	1	4

a. Find $f(g(x))$ for the six values of x in the table.

b. Find $g(f(2))$, and show that it does *not* equal $f(g(2))$.

SOLUTION

a. To find $f(g(1))$, first find the value of the *inside* function, $g(1)$, by finding 1 in the x-column and $g(1)$ in the $g(x)$ column (third column).

$$g(1) = 5$$

Then use 5 as the input for the *outside* function f by finding 5 in the x-column and $f(5)$ in the $f(x)$ column (second column).

$$f(5) = 0$$

$$\therefore f(g(1)) = 0$$